

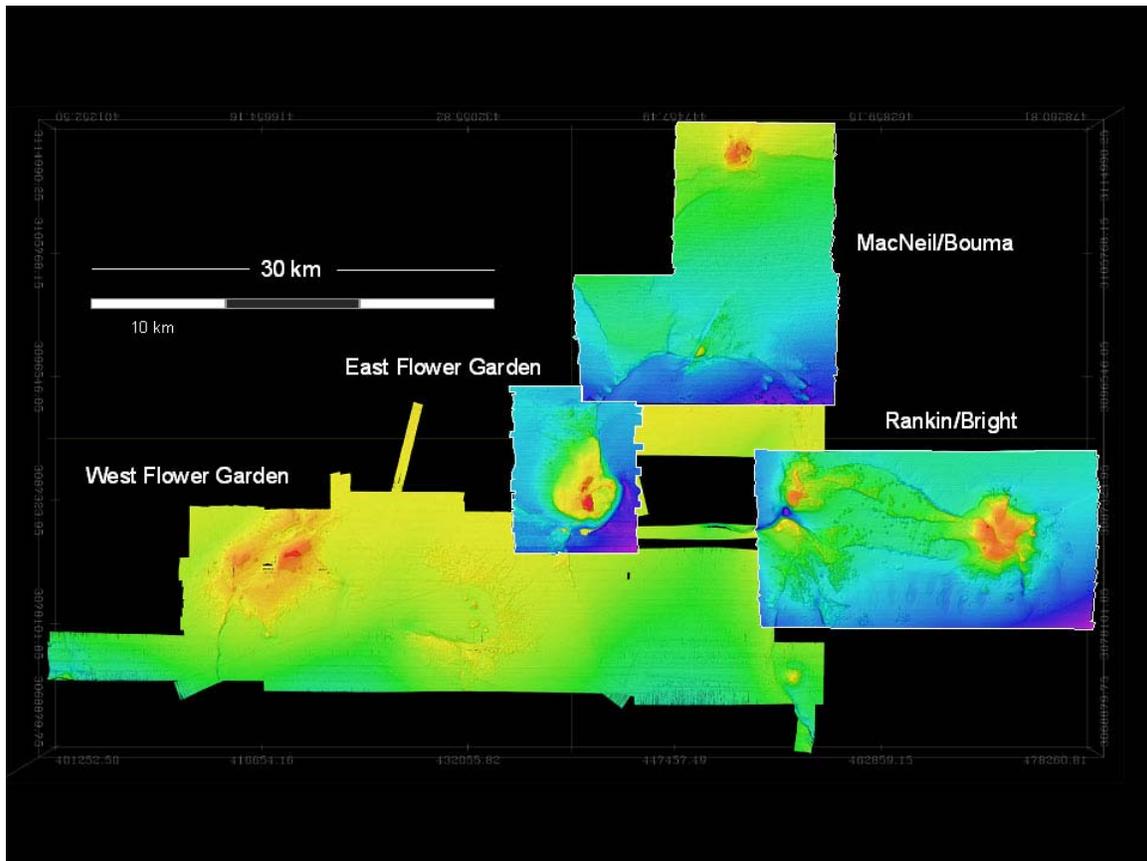


Flower Garden Banks National Marine Sanctuary

Research Summary

2004

Prepared by
Emma L. Hickerson
Research Coordinator



Flower Garden Banks Regional Bathymetric Chart

January 2005

A. OVERVIEW

The purpose of this document is to report the activities of the Research team during 2004. The team included Emma L. Hickerson (Research Coordinator), G.P. Schmahl (Sanctuary Manager), and Doug Weaver (GIS specialist).

B. SUMMARY

The FGBNMS research team was involved in 15 research cruises in 2004, at a value of approximately \$552K for cruises in the NW GOM, \$71K of which came directly out of FGBNMS FY04 budget. The FGBNMS utilized approximately \$481K worth of research time and equipment through NOAA shiptime and donated shiptime from NASA/United States Alliance. Three ROV cruises continued the characterization of the reefs and banks in the Northwestern Gulf of Mexico. A total of 96 hr 15 mins of ROV time was accomplished. Directed sampling for antipatharian and gorgonians, and sponges was conducted – an effort that will contribute to a series of regional catalogs. The location of an oceanographic weather buoy was determined during ROV surveys – this TABS buoy was sunk during a recent hurricane. Over 1100 square km of high resolution multibeam bathymetry was obtained in the region during a cruise on board the NOAA Ship Thomas Jefferson. A pool of 52 sanctuary personnel, scientists, and volunteer divers conducted approximately 608 SCUBA dives during the 2004 field season. Activities included biological surveys, equipment maintenance, removal of invasive species, and image collection. Eleven Sanctuary permits were processed, and an additional 4 were ongoing. A call for papers was put out for a second dedicated issue of the Gulf of Mexico Science Journal, highlighting science in and around the FGBNMS. International collaboration with Belize continues through field work – acoustic tags were placed on manta rays at the FGBNMS, and the Sanctuary participated in a rapid assessment of the Lighthouse Reef Reserve in Belize.

C. CRUISES (\$ amt. represents approximate shiptime value)

1. FGBNMS-2004 – Datasonde changeout I– January 13, 2004. R/V Pt. Glass. Stetson Bank only. Hickerson. \$2.5K

2. FGBNMS – 2004 – Multibeam surveys – NOAA Ship Thomas Jefferson – May 12 –21, 2004. Conducted multibeam surveys within and in the vicinity of the FGBNMS (884 square km unmapped previously, 1129 square km total). Participant collaboration included University of New Hampshire, and Texas A&M University. Weaver. \$300K

3. FGBNMS – 2004 - DFH7 – R/V Fling – May 24 – 28, 2004 - Conducted 11 ROV surveys, including 25 photographic transects at McGrail Bank to document coral cover. 6 surveys at McGrail Bank, and 5 surveys at West Flower Garden Bank. Obtained close to 700 high resolution digital images, and 18 hours of digital video. Collected 2 antipatharians (*Antipathes atlantica*) and 2 gorgonians at West Flower Garden Bank for identification by Smithsonian. Also collected a soft coral, *Chironepthya* (= *Siphonogorgia*) *caribaea* – verification of identification by Stephen Cairns, Smithsonian Institute. Schmahl, Hickerson, Weaver \$20K

4. FGBNMS – 2004 – Stetson Bank Long Term Monitoring – June 14 – 16 – Conducted annual long term monitoring – including photographic stations and video transects. 4 REEF volunteers conducted 28 roving fish surveys. Additional projects included conch tagging (Craig Burnside). 34 queen conch and 3 milk conch were tagged and measured. Dr. Mary Wicksten collected 4 unidentified invertebrates for cataloging and inventory (Mary Wicksten). Sanctuary photographers, Joyce and Frank Burek, photographed 10 additional species for the library. Schmahl, Hickerson, Weaver \$9K

5. FGBNMS – 2004 – Drop camera surveys I – June 5-7th. Conducted drop camera surveys to groundtruth bathymetry and add to habitat characterization map. Weaver \$7.5K

6. FGBNMS – 2004 – Coral Spawning – M/V Spree - August 6-10. 18 participants, including Sanctuary personnel, researchers, and volunteers – representing University of Calgary (Vize – coral spawning), TAMU (Wicksten – crustaceans, and cleaning behavior), University of Houston (Jimenez – algae/coral dynamics, Borneman – coral diseases), University of California – Davis (DeBose – cephalopods), Wildlife Conservation Society (Graham – acoustic and satellite tagging of elasmobranchs). Low levels of “confused” spawning was documented. A spawning report was generated and posted to the Coral List. Rachel Graham (WCS) successfully tagged 2 manta rays and deployed Vemco VR2 acoustic receivers at the East FGB and Stetson Bank. Jimenez removed 8 exclusion cages on the reef at WFGB. Hickerson and Borneman conducted baseline bleaching surveys at both the East and West FGB’s. Hickerson \$15K

7. Gulf of Alaska – July 28 – August 24, 2004 . G.P. Schmahl participated in a cruise on board HBOI’s Research Vessel *Atlantis*, sponsored by NOAA’s Office of Ocean Exploration. PI’s: Dr. Tom Shirley, University of Alaska, Fairbanks, Dr. Randy Keller, Oregon State University, Dr. Amy Baco-Taylor, WHOI, and Dr. Peter Etnoyer. The objective of the cruise was to explore five seamounts of the Gulf of Alaska – and conduct surveys at three depths to determine zonation: 700m/1700m/2700m. Seventeen dives were conducted on board the HBOI submersible – Alvin. The FGBNMS’s participation through G.P. was to lend his expertise for the sponge collections. A total of 34 sponges were collected, representing at least 21 species. Several of these collections are new species to science.

8. Sonnier Bank – Pt. Glass – NMFS/TAMU Galveston collaboration. August 9-13, 2004. Assist with (SCUBA) fish surveys, ROV surveys, drop camera surveys. Weaver. \$10K

9. FGBNMS – 2004 – Agency/Industry Information Transfer Cruise. August 16 – 18, 2004., M/V Fling. This annual cruise was successfully conducted. Discussions and presentations were achieved both onshore and offshore, regarding cross cutting issues and objectives between agencies and industry. Participants included NOAA General Counsel, EPA, MMS, TPWD, Shell Global Solutions US, Diamond Offshore, BP, Shell E&P co., Univar, Dominion, Agip, Marathon, and Devon. Hickerson, DuPuy \$9K

10. FGBNMS – DFH8 – August 30 – September 9, 2004, NOAA Ship Nancy Foster - Conducted 38 ROV surveys (EFGB, WFGB, Stetson, McGrail Banks) and 7 SCUBA dives (EFGB, WFGB, Bright, and Geyer Banks). Obtained close to 1380 high resolution digital images, and 37 hours of digital video. Obtained 60 antipatharian and gorgonian samples using the ROV. Steve Gittings (NMSP HQ), Greg McFall (Gray's Reef NMS), Sarah Fangman (Channel Islands NMS) and Mary Wicksten (TAMU) assisted during the cruise. Kris Baumgartner, our NOAA's Teacher-at-Sea, was also on board. Hickerson, Schmahl, Weaver, Kurelja. \$100K

11. FGBNMS East and West Bank Long Term Monitoring – M/V Fing. September 20, 2004. Annual Long Term Monitoring contract. Cruise cut short due to inclement weather. 90% of East Bank monitoring completed. \$3K

12. FGBNMS – DFH9 – USA Ship Liberty Star. October 25 – November 1, 2004. Collaboration between USA/NASA, NURC, and FGBNMS – Conducted 14 ROV surveys (WFGB and EFGB) and 5 SCUBA dives (EFGB, WFGB, Bright, Geyer, and Claypile Banks). Obtained close to 365 high resolution digital images, and 15 hours of digital video. Confirmed location of one out of two of the sunken TABS buoys. Collected 56 sponge samples, and 2 algae samples using ROV. SCUBA ops included collection of algae samples at WFGB, Bright and Geyer Banks, exploration dives at Claypile Bank, and removal of 46 colonies of invasive coral – *Tubastraea coccinea* at Geyer Bank. Hickerson, Schmahl, Weaver. \$75K

13. FGBNMS – East and West Bank Long Term Monitoring – M/V Fling. November 19-20, 2003. Annual Long Term Monitoring contract. Cruise cut short due to inclement weather. 95% of West Bank monitoring completed. Of note: whale shark, manta ray, increased levels of *Diadema*, possible diseased *Siderastraea* head. Weaver. \$12K

D. CANCELLED AND/OR POSTPONED CRUISES:

- 1. FGBNMS – 2004 – Coral core drilling – February 9-13, 2004** (postponed due to weather)
- 2. FGBNMS – 2004 – Coral core drilling – May 17-21, 2004** (postponed due to weather)
- 3. FGBNMS – 2004 – coral core drilling – June 21 – 23, 2004** (postponed due to engine failure on M/V Fling)
- 4. FGBNMS – 2004 – Coral core drilling – September 13-15, 2004** (postponed due to weather).
- 5. FGBNMS Long Term Monitoring – October 4-8, 2004** (postponed due to weather).

6. **FGBNMS Long Term Monitoring – October 18-22** (postponed due to weather, after transiting to and returning from site).

7. **FGBNMS Long Term Monitoring – November 1-5** (postponed due to weather).

E. PUBLICATIONS:

Fenner, Douglas and K. Banks. (2004) Orange Cup Coral *Tubastraea coccinea* invades Florida and the Flower Garden Banks, Northwestern Gulf of Mexico. Coral Reefs. 23:505-507.

Weaver, D.C. and Hickerson, E.L. (In Press) *Halichoeres bureki*, a new wrasse (Pisces: Labridae) from the Flower Garden Banks National Marine Sanctuary, Northwestern Gulf of Mexico.

Weaver, D.C., Hickerson, E.L., Schmahl, G.P. (In Press) Deep reef fish surveys by submersible on Alderdice, McGrail, and Sonnier Banks in the Northwestern Gulf of Mexico.

Schmahl, G.P., Hickerson, E.L., (In Press) Deep tropical coral reef communities in the northwestern Gulf of Mexico.

F. OTHER SCIENCE PRODUCTS

- Deep Water Habitat cruise notebooks
- 2004 Research Report

G. PROPOSALS:

Submitted:

- NMSP 2004 – Science Mini-Grant - Use of seamount habitat by economically important fish species – acoustic tagging at the Flower Garden Banks NMS
- NOAA Coral Reef Conservation Program - Baseline Coral Health Assessment in the Flower Garden Banks National Marine Sanctuary
- NOAA Coral Reef Conservation Program - Paleoclimatology of the corals of the Flower Garden Banks NMS - monitors of environmental change.
- NMSP 2005 – Science Mini-Grant - Paleoclimatology of the corals of the Flower

Garden Banks NMS - monitors of environmental change.

Accepted:

- NOAA Coral Reef Conservation Program - Baseline Coral Health Assessment in the Flower Garden Banks National Marine Sanctuary (Ritchie-Mote Marine Lab in collaboration with FGBNMS)\$39.5K
- NMSP 2005 – Science Mini-Grant - Paleoclimatology of the corals of the Flower Garden Banks NMS - monitors of environmental change (Slowey/Bratcher – TAMU in collaboration with FGBNMS). \$25K

Rejected:

- NURC – 2004 continuation of exploration and characterization of northwestern Gulf of Mexico – ROV, shiptime, TriMix training and subsequent exploration
- NOAA’s Office of Ocean Exploration 2004 – continuation of exploration and characterization of northwestern Gulf of Mexico – submersible, shiptime, bathymetric surveys
- NMSP 2004 – Science Mini-Grant - Use of seamount habitat by economically important fish species – acoustic tagging at the Flower Garden Banks NMS
- NOAA Coral Reef Conservation Program - Paleoclimatology of the corals of the Flower Garden Banks NMS - monitors of environmental change.

H. ADDITIONAL SCIENCE ACTIVITIES:

- Submitted FY05 shiptime requests.
- Assisted FKNMS in planning for multibeam surveys on board the NOAA Ship *Thomas Jefferson*.
- NOAA CRCP Working Group activities.
- Assisted with NMFS Galveston/TAMUG Sonnier Bank surveys – Sonnier Bank.
- Submitted monthly shiptime reports to NMAO.
- Provided funding to REEF to report on last 10 years of REEF surveys at the FGBNMS.
- Coordinated with researchers in CRCP proposal submissions.

I. NEW CORAL RECORDS FOR NORTHWESTERN GULF OF MEXICO

As a result of ROV and SCUBA surveys, the following new records of scleractinian coral records were documented at various banks of the NW Gulf of Mexico:

McGrail Bank

Agaricia undata

Agaricia lamarki

Colpophyllia natans

Dichocoenia stokesi

Scolymia cubensis

Bright Bank

Millepora alcicornis

Stephanocoenia intersepta

Agaricia undata

Agaricia lamarki

Montastraea franksi

Colpophyllia natans

Diploria strigosa

Dichocoenia stokesi

Geyer Bank

Stephanocoenia intersepta

Agaricia undata

Tubastraea coccinea

East and West Flower Garden Bank

Plumapathes pennacea

The following antipatharians (black corals) were collected during ROV ops in the Sanctuary , and identified by Dennis Opreska (Smithsonian Institute) and added to the Sanctuary species list:

Acanthopathes thyoidea

Antipathes atlantica

Antipathes furcata

Elatopathes abientina

Phanopathes expansa

Plumapathes pennacea

Stichopathes lutkeni

Tanacetipathes tanacetum

J. RESEARCH AND SCIENCE PARTNERSHIPS

- Azure Photographic Services
- Dauphin Island Sea Laboratory (DISL)
- Environmental Protection Agency (EPA)
- GeoMarine, Inc.
- Minerals Management Service (MMS)
- National Undersea Research Center (NURC)
- National Marine Fisheries Service (NMFS)
- North Carolina Coastal Ocean Service (NCCOS)
- PBS&J
- Reef Environmental Education Foundation (REEF)
- Texas A&M University (TAMU)
- Texas A&M University – Galveston – (TAMUG)
- Texas A&M University (TAMU) – Geochemical and Environmental Research Group (GERG)
- Texas Parks and Wildlife (TPWD)
- U.S. Geologic Survey (USGS) – Woods Hole
- University of Calgary
- University of California – Davis (UC-Davis)
- University of Houston
- University of Louisiana – Lafayette
- University of New Hampshire (UNH) – Dr. Jim Gardner
- Wildlife Conservation Society (WCS) – Dr. Rachel Graham, Punta Gorda, Belize

K. CONFERENCES, MEETINGS, PRESENTATIONS, TRAINING, ETC.

1. NOAA Working Diver Training – Key West, FL – January 12-30, 2004. Weaver
2. NCCOS/Sea Grant Biomarker/Cellular Diagnostics Workshop, Key Largo, FL – January 17-18, 2004. Hickerson
3. Research Coordinator’s Meeting – Santa Barbara/Santa Cruz Island, CA – February 1-7, 2004. Hickerson
4. Underwater Intervention Conference – New Orleans, LA – February 17-19, 2004. Presenter - Schmahl.
5. FGBNMS/EPA Meeting - College Station, TX - March 2, 2004. Schmahl, Hickerson.
6. Gulf Coast Fisheries Meeting – Mobile, AL – March 10-22, 2004. Hickerson
7. Benthic Ecology Meeting – Mobile, AL – March 25-28, 2004. Presenters: Hickerson, Bernhardt. Schmahl also attended.
8. Permit Coordinators Meeting – April 6-8, 2004. Schmahl, Hickerson.
9. TPEC Meeting – FGBNMS LTM – April 12-14, 2004. Schmahl, Hickerson.
10. NMFS Point Glass Meeting – Freeport, TX – April 28, 2004. Schmahl, Hickerson, Weaver.
11. CINMS – ROV cruise – technology information transfer – May 12-15, 2004. Hickerson.

12. International Coral Reef Symposium – June 28 – July 2, 2004. Okinawa, Japan. Schmahl, Hickerson.
13. SHIELD/RUST Training – July 26 – 30, 2004. Washington, DC. Hickerson
14. NOAA Diver Training – September 13 – October 1, 2004. Seattle, WA. Kurelja.
15. NOAA Divemaster Training – September 27 – October 1, 2004. Seattle, WA. Hickerson
16. 57th Gulf and Caribbean Fisheries Institute conference – St. Petersburg, FL. November 8-12, 2004. Weaver.
17. 5th International Symposium in Fisheries Ecology – Sarasota, FL. November 9-11, 2004. Schmahl.
18. Gulf and Atlantic Fisheries Management Council meeting – Tampa, FL. December 7, 2004. Schmahl.
19. NMFS/NMSP Protected Resource Meeting – Long Beach, CA. December 6-9, 2004. Kurelja.

L. INTERNATIONAL COLLABORATION

Dr. Rachel Graham (Wildlife Conservation Society) participated in a research cruise to the FGBNMS (August coral spawn) to initiate an elasmobranch acoustic and satellite tagging program. Acoustic tags were successfully deployed on 2 manta rays, and acoustic receivers were deployed on 2 corresponding banks – East Flower Garden Bank and Stetson Bank.

E. Hickerson traveled to Belize to participate in a rapid environment assessment (REA) of two MPA's – Half Moon Caye, and Blue Hole, both within the Lighthouse Reef area. The data resulting from the REA will feed directly to the development of a Management Plan for the MPA's by the Belize Audubon Society.

M. SCIENTIFIC INTERPRETATION/OUTREACH ACTIVITIES

1. Maintenance of slide library
2. Maintenance of digital slide catalog/library
3. Maintenance of Power Point presentation catalog
4. Maintenance of video library (annotations)
5. Development of PowerPoint presentations for various events
6. Attended Sanctuary Web discussions.
7. Coordination of sighting data from recreational dive vessels.
8. Development of collage interpretation sheet.
9. Assisted with DUOY participant selection process.
10. Coordinated WFGB 3D model development.
11. Purchased underwater digital cameras to be placed on recreational dive vessels for documentation and observation for the FGBNMS.
12. Developed species list (100 species) for Sanctuary Encyclopedia project.
13. Assisted in development of FGBNMS submission of the Status of the Coral Reefs of the United States
14. Participated in recreational cruises as Sanctuary Naturalist On Board (Weaver).

15. Coordinated diving operations on Agency/Industry Cruise.
16. Assisted with pre-cruise operations with Tennessee Aquarium Cruise.

N. MANAGEMENT ACTIVITIES

- Writing of permits for science activities
- Attended Sanctuary retreats
- Responded to oil and gas industry spill drills in Manager's absence.
- Attended Gulf of Mexico Fisheries Management Council Meeting.
- Participated TPEC for FGBNMS LTM.
- Participated in Joint Industry Project (JIP) conference calls.
- Participated in development of the State of the Sanctuary Report.

O. TECHNOLOGY

1. Purchase of research drop camera.
2. Maintenance and development of media equipment.
3. Research for underwater technologies to further Sanctuary's capabilities.